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the significance of consciousness in evolution, of the process called control, it would at least not seem unreasonable to ask for some attempt to investigate in these directions. The 'plain man' is indeed reassuringly told that he may continue to say that certain changes in the physical world take place because a certain man formed a plan—provided he means only that there has been a constant relation between plan and accomplishment. But I for one should have been glad to have some suggestions toward a way of thinking consciousness and the physical world in view of these facts.

With regard to the discussions on space, it seems to me that the criticisms of the Kantian view misinterpret the implications of the phrase 'infinitely divisible.' To hold that a finite line, which is infinitely divisible, can be traversed, does not involve the doctrine that one must complete an infinite series in order to traverse it. The doctrine of infinite divisibility implies that if you proceed along a series, in which the law is that each successive term is half the preceding, you can never reach the limit *in that way.* This, however, does not mean that to pass over any space you must do it according to that law. Of course, too, the mathematical interpretation of his spinning top would be, that if the speed were increased the time of the revolution would approach nearer and nearer to zero as its limit; it would never reach that limit. While Professor Fullerton was inserting these puzzles, he might in consistency have further edified the reader by quoting one of the consequences of Berkeley's theory which that author himself was acute enough to discover, viz., that an isosceles right-angled triangle can not be drawn. For if a line is composed of a definite number of points, then the hypothenuse of such a triangle would have to be composed of a number of points equal to the square root of two, which is not an exact number.

In writing this notice I have sought to point out the chief features in the standpoint which seem to me to challenge attention. I have not thought it necessary to dwell on the acuteness, the brilliancy and the force with which Professor Fullerton has urged his views. These will be anticipated by those who are acquainted with his writing, and will be recognized by the reader. I can but feel, however, a decided regret that the author did not see fit to take up more directly the problems suggested to the thinker of to-day by natural science and history, and to push forward the boundary of our thinking along these lines.

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Analysis of 'Localization,' Illustrated by a Brown-Séquard Case. C. SPEARMAN. *British Journal of Psychology,* Vol. I., No. 3, pp. 286–314.

The main contention of this paper is in the direction of a vigorous protest against the dictum of Förster, that tactile localizing power is completely dependent upon the efficiency of movement-sensations. The occasion for the present analysis was afforded by a Brown-Séquard case under treatment in the Leipzig nerve hospital about a year ago. Upon admission to the hospital the condition of the patient was as follows: The movements of the *left* leg were atactic, and all sense of its position was lost. Tactile sensibility on this leg was diminished but not destroyed. The movements of the *right* leg were only slightly atactic, and the perception of position was normal. The tactile sensibility of this leg was almost completely destroyed. After the removal of a knife-point which, in a stabbing fray twenty-six years before, had been broken off at the left of the sixth dorsal vertebra, the patient began a slow but steady improvement. The operation was performed in October, 1903. For four months, beginning with the following May, the patient was under examination by the writer, and about 3,800 careful tests were made.

As a preliminary to the spatial tests, an exact quantitative determination was made of the sensibility to movement and to contact on the two legs. The general state of these matters has already been noted. In the course of the experiments it was found that fatigue diminished the movement sensibility of the left leg only and the tactile sensibility of the right leg mainly.

The capacity to localize cutaneous impressions on the legs was then subjected to a detailed examination. Three methods of procedure were used: the 'simple,' where, after the manner of Henri, sight and contact were excluded; and those of Weber and Volkmann, termed 'groping' and 'looking,' respectively. The three methods gave diverse results. By the 'simple' method the left leg (insensible to movement) showed the greater inability to localize contacts. But by the other two methods this same left leg displayed the greater localizing capacity. In all three cases fatigue produced no appreciable change. It is significant to note in connection with this last fact that it was only in the state of fatigue that the compass test showed any very marked derivations from the normal on most of the regions explored. In fatigue, however, all power to discriminate the two points, whether simultaneously or successively applied, was lost.

The attempt to interpret these seemingly conflicting results forces the author to make a fresh critical analysis of the various localizing processes. With the general features of this analysis most psychologists would, I fancy, be in substantial agreement. Special interest attaches to the discussion of the 'simple' localization. How does a finger-tip come to point with any degree of accuracy at a stimulated point on a lower limb? It would seem that one must first know just where in surrounding space this stimulated part of the limb is. This information can not, however, be given by 'positional' sensations, for there are no such sensations. Nor, on the other hand, can introspection find any movement-sensations finely enough graded to serve as accurate indications of a limb's position, not to mention the fact that, if they did exist, the localizer would have to collect and interpret all the messages from the joints in the entire circuit from the finger-tip to the excited spot—a process not to be discovered in consciousness. The writer is therefore forced to assume that the arousal of perceptions of position is accomplished by the mechanical summation, without accompanying consciousness, of neural excitations caused by movement,—proceeding possibly from the corpuscles of Vater,—the result alone reaching consciousness under the form of a definite spatial perception. Derangement of this purely physiological mechanism is responsible for the impairment of localization as well as for definite illusions such as allocheiria, the excitations either failing to reach the cortex, or arousing a wrong cortical area, and thus evoking an erroneous spatial image.

On this view loss of sensibility to movement, and loss of power to localize tactual impressions, may, to be sure, be coincident, but they are not causally related. The lesion that impairs one function may or may not impair the other also. The improvement in localizing under the methods of 'groping' and 'looking' is due, the author holds, to the aid of the associated spatial images which are aroused in addition to the pure 'thereness' of the 'simple' method.

The contention which the author is chiefly interested in supporting seems to be well maintained. The merits of the paper lie in the presentation of trustworthy experimental data, and in the clear and comprehensive analyses, a genuine contribution being made to both fact and theory. We are thus helped to advance a little in this puzzling field of tactual localization. It seems a great pity, however, that the patient himself could not have been made to contribute to the matter by his own introspections. If such were gleaned, they are not revealed to us. The analyses of the localizing process refer to the normal individual. But as welcome and as badly needed as these are, we have still greater need of analyses made by one in whom the localizing functions are deranged. Must we wait for a Brown-Séquard case in the person of a professed psychologist before our needs are satisfied? A. H. PIERCE.

SMITH COLLEGE.

A Comparison of Some Mental and Physical Tests in their Application to Epileptic and Normal Subjects. W. G. SMITH. *British Journal of Psychology,* January, 1905. Vol. I., No. 2, pp. 240–261.

Six normal individuals (attendants in an asylum), five epileptics whose general intelligence was not notably impaired, and five epileptics showing marked dementia were tested with respect to power of recognition, immediate memory, simple and choice reaction time, discrimination of length, rapidity of movement, tremor, rhythm and strength of grip. In discrimination of length, rapidity of movement, tremor, rhythm and strength of grip there was no apparent difference between the groups. No demonstrable differences were found in the influence of practice, though the normal individuals seem to improve slightly more. In recognition, memory and reaction time the epileptics are inferior; the essential facts being as follows:

RECOGNITION.

	PICTURES.				WORDS.			
	Forgetting.		Confusion.		Forgetting.		Confusion.	
	av.	m.v.	av.	m.v.	av.	m.v.	av.	m.v.
Normal	1.2	0.5	0.8	0.4	1.7	0.6	0.8	0.5
I. Epileptic (nearly normal)	1.3	0.7	0.7	0.5	2.1	0.8	1.9	1.3
II. Epileptic (demented)	1.7	1.0	2.5	1.2	2.2	1.2	3.3	1.3